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Title of Investigation: Design Data Collection with Skylab/EREP Microwave Instrument S-193

Title of Report: Design Data Collection with Skylab/EREP Microwave Instrument S-193

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Prepared for:

Principal Investigations Management Office
Technical Monitor: Mr. Larry B. York
NASA Lyndon B. Johnson Space Center
Houston, Texas 77058

Prepared by:

Arun Sobti, Project Engineer
University of Kansas Center for Research, Inc.
Remote Sensing Laboratory
Lawrence, Kansas 66045

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THE UNIVERSITY OF KANSAS CENTER FOR RESEARCH, INC.

2385 Irving Hill Rd.—Campus West Lawrence, Kansas 66044

DESIGN DATA COLLECTION WITH
SKYLAB/EREP MICROWAVE INSTRUMENT S-193

Richard K. Moore, Principal Investigator
Fawwaz T. Ulaby, Co-Investigator

Arun Sobti
Project Engineer

Cheng King, John Barr, Bruce Short
and Saad Ulaby
Research Assistants

Remote Sensing Laboratory
Center for Research, Inc.
University of Kansas
Lawrence, Kansas 66045

Larry York, Technical Monitor
Principal Investigations
Management Office
Lyndon B. Johnson Space Center
Houston, Texas 77058

EREP No. 549-M, March 28, 1973 to September 30, 1974
Contract Number NAS-9-13331

DESIGN DATA COLLECTION WITH SKYLAB/EREP MICROWAVE INSTRUMENT S-193

The University of Kansas Center for Research, Inc. reports the following work performed during the period 1 June 1974 to 30 June 1974.

1.0 CONTINUING STUDIES

1.1 (Task 2.1.1.2, 2.1.3.1, 2.1.3.2) Development of Catalogue for Radiometer Temperature Measurements Performed to Date.

Satisfactory progress was made in compilation of this catalogue.

1.2 (Task 2.1.3.3) Study of Effects of Atmosphere Upon S193 Rad/Scat Measurements

Satisfactory progress was made in compilation of this report.

1.3 (Task 2.1.1.5, 2.1.3.1, 2.1.3.2) Ground Truth Collection and Data Catalog

The brunt of the effort is involved in preparing for a classification scheme based upon either SKYLAB S193 data or upon supporting evidence (e.g. S190 photographs, land-use maps, etc.). To this end, a specific-site study (initiated earlier) has been advanced. This specific-site study is based upon three or four sites for which the interpretation can be enhanced by the simplistic (e.g. one category only) nature of the terrain or by virtue of additional ground truth information (e.g. soil moisture samples); it should provide a guideline by which to classify the S193 Rad/Scat data.

Statistical procedures are being applied to the S193 Rad/Scat data. For example, histograms of distribution of the radiometric temperature and differential backscattering coefficient for each pass, polarization, incidence angle and mode are being generated. These will be combined to form a composite histogram of distribution for each polarization and incidence angle as perceived by SKYLAB S193.

Examples of some of the preliminary histograms for the distribution of the radiometric temperature are provided in Figures (1) through (5).

The cataloging of the land-use type for each footprint to be used for correlation with S193 data is being confined to areas of near homogeneous terrain. We feel this will allow for easier correlation with S193 data; later, this correlation will be attempted on multiple category footprints.

2.0 REPORTS COMPLETED

There were no reports completed this month.

3.0 SPECIAL ANALYSES

No special analyses were requested of us this month.

4.0 DATA RECEIVED

Attached is a preliminary copy of the S190 coverage we have received at the University of Kansas.

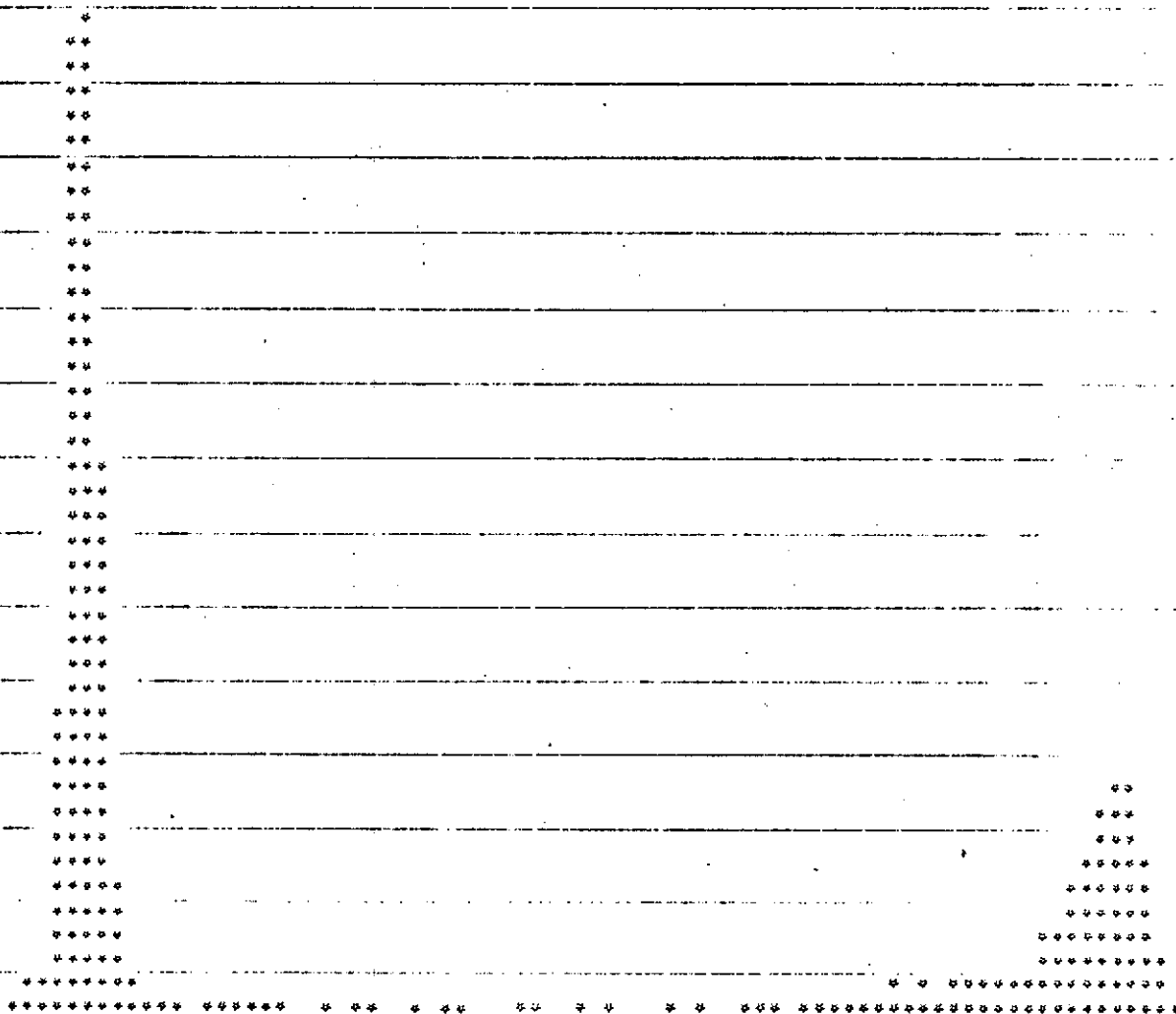
5.0 COMMENT

We are looking forward to visiting with NASA and other PI's later this month.

AS:rh

FROM CUBA TO BOGOTA, COLOMBIA
LAT. 20.9974 LONG. -82.4208
TO
LAT. 6.2599 LONG. -70.7280

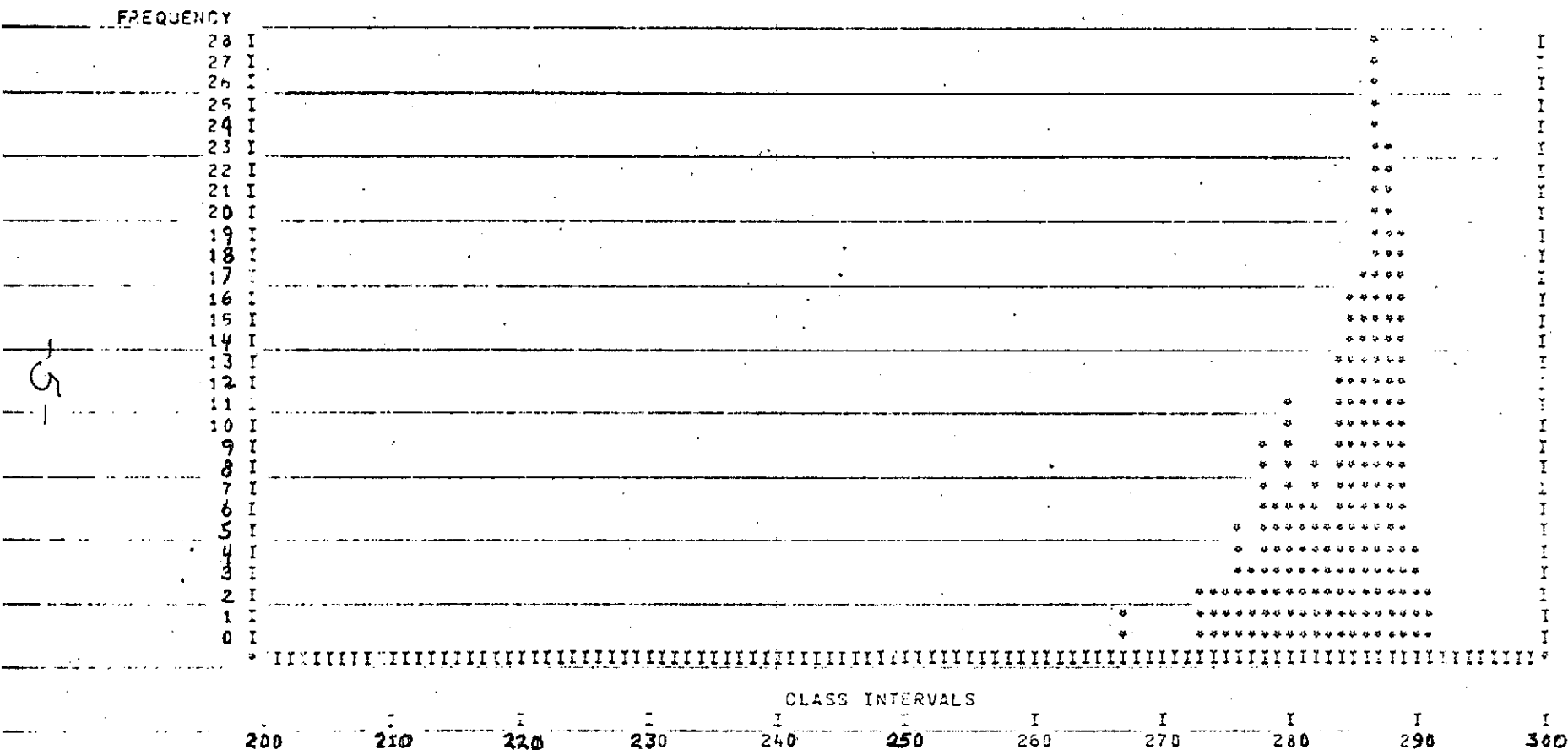
```
HISTOGRAM OF THE DISTRIBUTION
INITIAL POINT = 1.000000E 02
END POINT     = 3.000000E 02
CLASS INTERVALS = 100
INTERVAL SIZE  = 2.000000E 00
```



100 120 140 160 180 200 220 240 260 280 300

FROM MEXICO CITY TO ACAPULCO
 LAT. 19.1564 LONG. -100.9266
 TO
 LAT. 16.8700 LONG. -98.9834

HISTOGRAM OF THE DISTRIBUTION
 INITIAL POINT = 2.000000E 02
 END POINT = 3.000000E 02
 CLASS INTERVALS = 100
 INTERVAL SIZE = 1.000000E 00



PASS 2 R/S ITC 4 HH

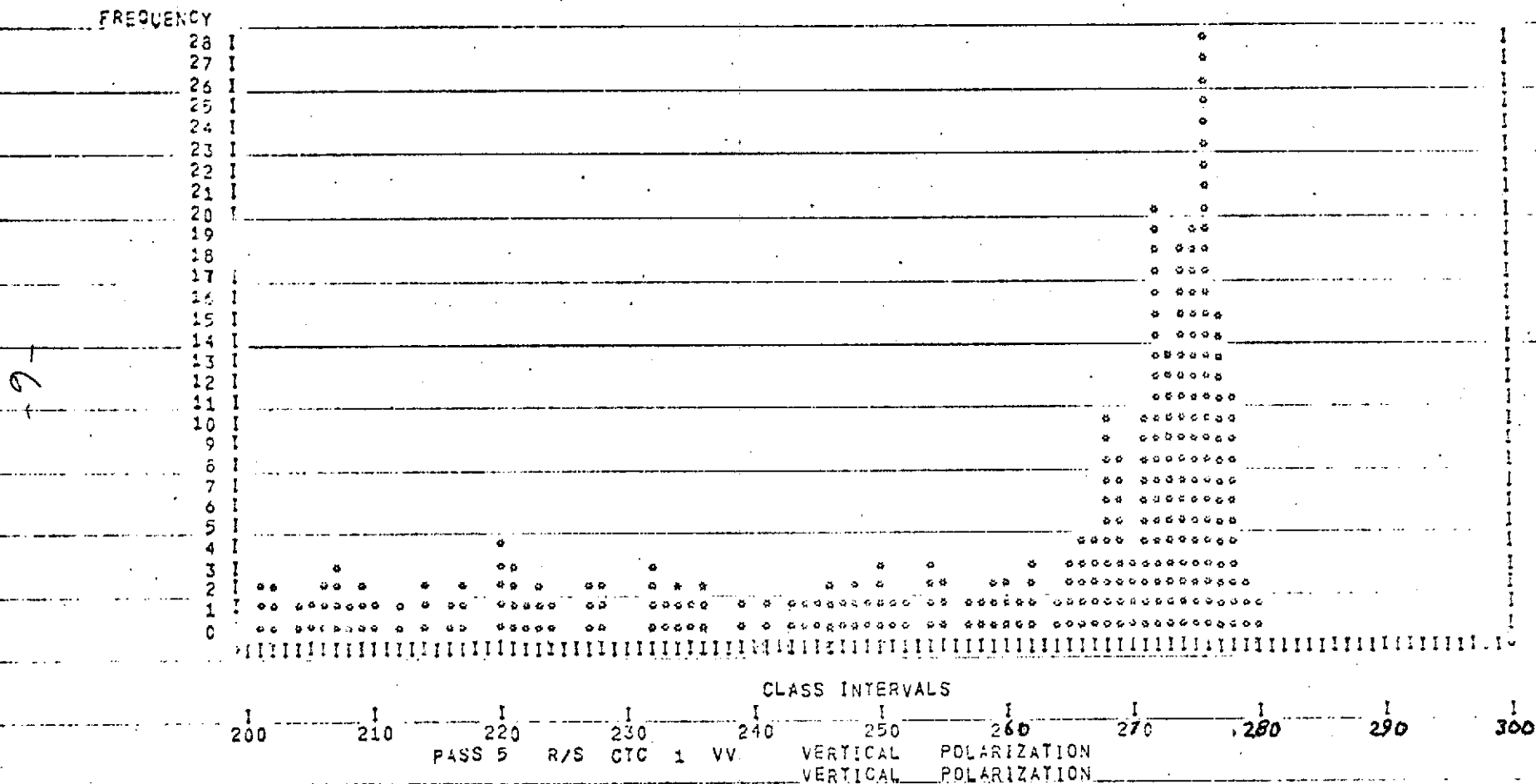
HORIZONTAL POLARIZATION INCIDENCE ANGLE IS BETWEEN 15 AND 30 DEGREES

RADIOMETRIC TEMPERATURE

Figure 2

FROM PLAINVIEW, TEX. TO BROWNWOOD,
TEXAS
LAT. 34.1336 LONG. -101.7760
to
LAT. 31.3116 LONG. -98.5738

HISTOGRAM OF THE DISTRIBUTION
INITIAL POINT = 2.000000E 62
END POINT = 3.000000E 62
CLASS INTERVALS = 100
INTERVAL SIZE = 1.000000E 00



RADIOMETRIC TEMPERATURE

Figure 3

HISTOGRAM OF THE DISTRIBUTION
 INITIAL POINT = 1.150000E 02
 END POINT = 3.150000E 02
 CLASS INTERVALS = 100
 INTERVAL SIZE = 2.000000E 00

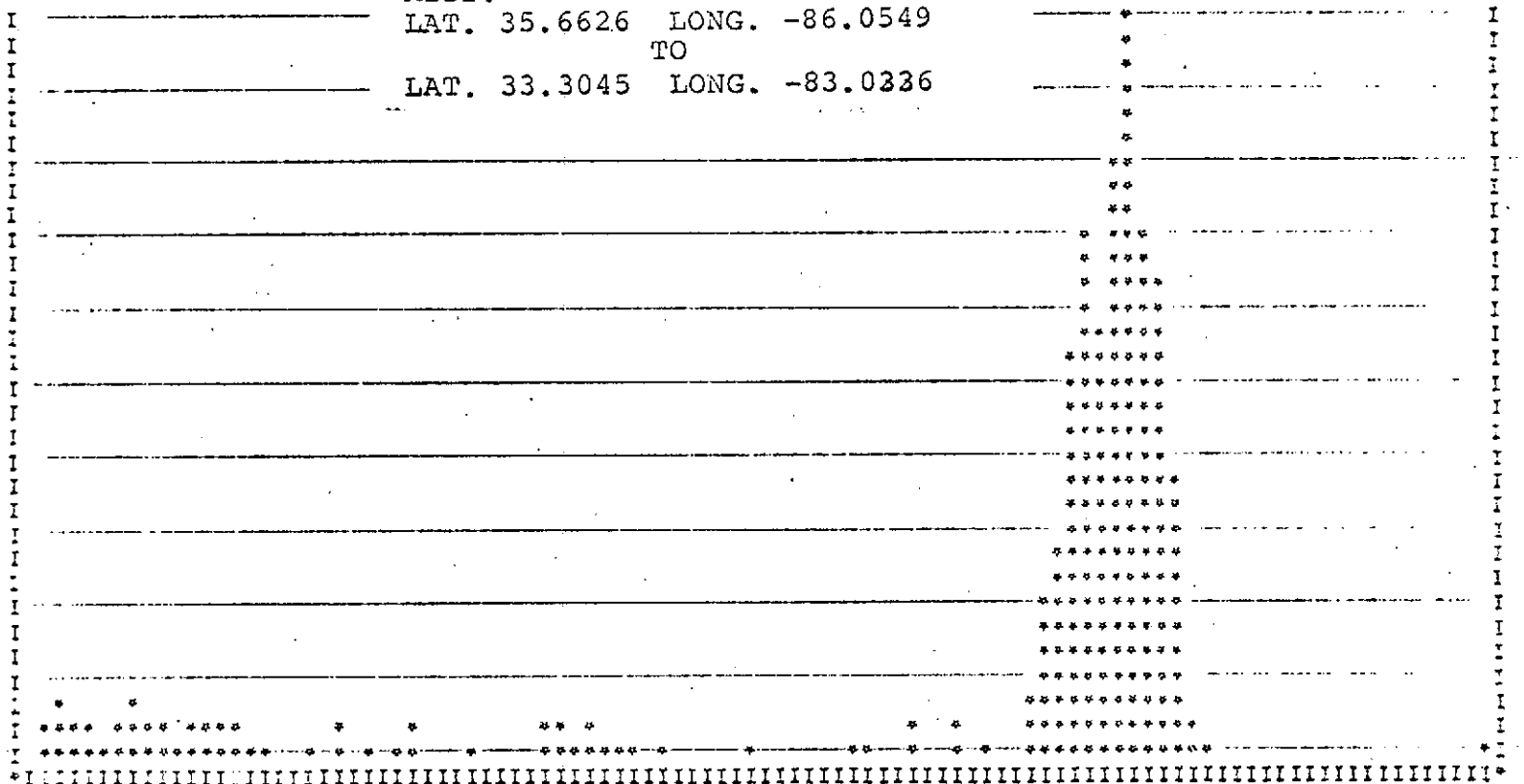
FROM CHATTANOOGA, TEN. TO ATHENS,
 MISS.

LAT. 35.6626 LONG. -86.0549
 TO

LAT. 33.3045 LONG. -83.0336

FREQUENCY

89 I
 86 I
 83 I
 80 I
 77 I
 74 I
 71 I
 68 I
 65 I
 62 I
 59 I
 56 I
 53 I
 50 I
 47 I
 44 I
 41 I
 38 I
 35 I
 32 I
 29 I
 26 I
 23 I
 20 I
 17 I
 14 I
 11 I
 8 I
 5 I
 2 I
 0



CLASS INTERVALS

115 135 155 175 195 215 235 255 275 295 315

PASS 6 R/S ITC 1 VV HORIZONTAL POLARIZATION
 HORIZONTAL POLARIZATION

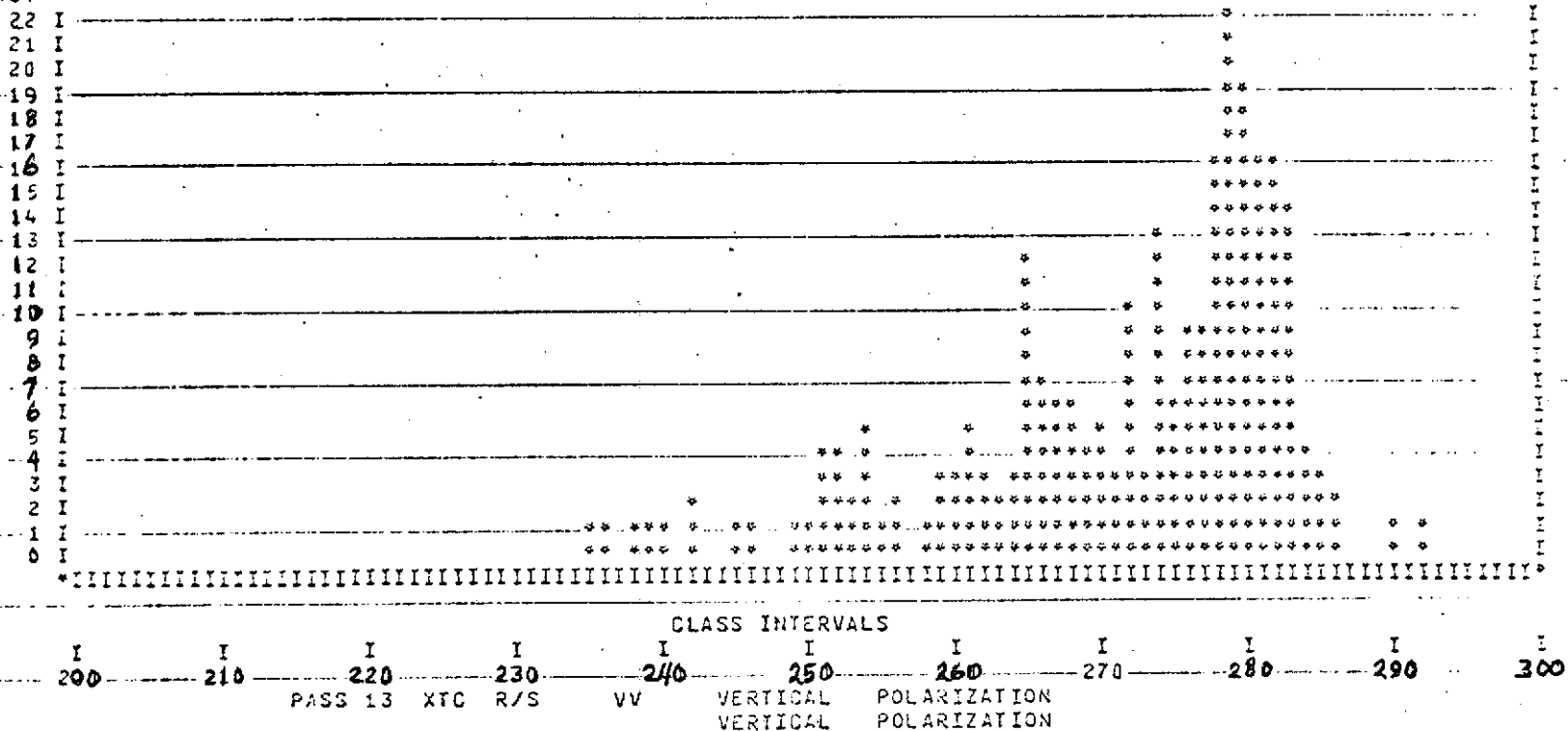
RADIOMETRIC TEMPERATURE

Figure 4

FROM LAMAR, COLO. TO PERRYTON, TEX.
 LAT. 38.8715 LONG. -103.8715
 TO
 LAT. 36.3508 LONG. -100.7423

HISTOGRAM OF THE DISTRIBUTION
 INITIAL POINT = 2.000000E 02
 END POINT = 3.000000E 02
 CLASS INTERVALS = 100
 INTERVAL SIZE = 1.000000E 00

FREQUENCY



RADIOMETRIC TEMPERATURE

Figure 5

DOY	START		STOP		FRAMES	COMMENTS
	LAT	LONG	LAT	LONG		
216	37.85	104.22	36.35	100.74	22-109/22-112	
216	36.67	100.20	34.57	97.55	22-112/22-115	22-114 is cloudy, 22-115 has 30% coverage
216	24.90	87.65	21.05	82.32	22-126/22-130	totally in a cloud, it has cloud coverage
217	40.69	79.51	41.56	81.35	22-187/22-190	The photos are overexposed, very faint
217	35.99	96.40	34.59	94.09	22-231/22-234	Cloud coverage
220	44.17	122.21	41.71	113.08	22-308/22-320	Exposure changes at 22-316
220	33.87	100.56	32.15	98.46	22-341/22-343	Cloud coverage
220	30.23	96.94	24.37	90.56	22-348/22-359	Cloud coverage from 22-348/22-356. The rest is OK
221	47.30	104.61	46.59	98.89	28-002/28-005	50% cloud coverage
221	46.95	98.47	43.99	93.83	28-005/28-009	Cloud coverage from 28-005/28-007. The rest is OK
221	45.07	92.70	41.18	86.48	28-008/28-016	100% cloud coverage from 28-012/28-016
221	38.81	80.52	39.73	82.38	28-020/28-023	

[illegible]